AMENDMENTS TO THE CLAIMS

Please cancel claims 1, 3-6, 9-10, 12, 21-23, 25, 27-28 and 32-40. Please amend claims 2, 7, 11, 15-20, 24, 26, 29 and 31. No new matter is believed to be introduced as a result of the aforementioned amendments. The following listing of claims replaces all prior versions and listings of claims in this application.

1. **(Canceled)**

2. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[1]] 7, wherein the modulation layer is doped with a concentration greater than $1x10^{19}$ cm^{-3}.

3. – 6. **(Canceled)**

7. **(Currently amended)** A vertical cavity surface emitting laser ~~according to claim 6, wherein the modulation doped layer is an AlInAs layer epitaxially grown as a digital alloy of p-type doped AlAs and InAs~~ comprising:

a substrate;

a first mirror stack over the substrate;

an active region having a plurality of quantum wells over the first mirror stack;

a tunnel junction over the active region, the tunnel junction including:

a p-layer that includes a modulation doped layer comprising an AlInAs layer epitaxially grown as a digital alloy of p-type doped AlAs and InAs; and

an n-layer that includes an n-layer of a compound selected from the group consisting of InP, AlInAs, AlInGaAs, InGaAsP, GaAs, AlAs, AlGaAs, InGaAs, AlGaAsSb, GaAsSb, AlAsSb, AlPSb, GaPSb, AlGaPSb, and combinations thereof; and

a second mirror stack over the tunnel junction.

8. **(Original)** A vertical cavity surface emitting laser according to claim 7, wherein the p-type AlAs layer is doped with carbon to a concentration greater than $1x10^{19}$ cm^{-3}, and wherein an effective doping concentration of the modulation doped layer is greater than $1x10^{19}$ cm^{-3}.

9. – 10. **(Canceled)**

11. **(Currently Amended)** A vertical cavity surface emitting laser ~~according to claim 10, wherein the modulation doped layer includes a SiAs layer and an AlGaInAs layer.~~ comprising:

a substrate;

a first mirror stack over the substrate;

an active region having a plurality of quantum wells over the first mirror stack;

a tunnel junction over the active region, the tunnel junction including:

an n-layer that includes a modulation doped layer comprising an SiAs layer and an AlGaInAs layer; and

a p-layer that includes a p-layer of a compound selected from the group consisting of InP, AlInAs, AlInGaAs, InGaAsP, GaAs, AlAs, AlGaAs, InGaAs, AlGaAsSb,GaAsSb, AlAsSb, AlPSb, GaPSb, AlGaPSb, and combinations thereof; and

a second mirror stack over the tunnel junction.

12. **(Canceled)**

13. **(Original)** A vertical cavity surface emitting laser according to claim 11, wherein the thickness of the SiAs layer is about 1/1000 of the AlGaInAs layer.

14. **(Original)** A vertical cavity surface emitting laser according to claim 11, wherein an effective doping concentration of the modulation doped layer is greater than 1×10^{19} cm^{-3}.

15. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[1]] 7, further including an n-type spacer adjacent the active region, and wherein the first mirror stack is an n-type DBR.

16. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[1]] 7, further including [[an]] a p-type spacer adjacent the tunnel junction, and wherein the second mirror stack is an n-type DBR.

17. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[1]] 7, further including:

an n-type bottom spacer adjacent the active region, and wherein the first mirror stack is an n-type DBR; and

[[an]] a p-type top spacer adjacent the tunnel junction,

wherein the first and second mirror stacks are each an n-type DBR.

18. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[5]] 7, wherein the p-layer is doped with carbon with a concentration greater than $1x10^{19}$ cm^{-3}.

19. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[1]] 7, wherein the active region includes one of InGaAsP and AlInGaAs.

20. **(Currently amended)** A vertical cavity surface emitting laser according to claim [[1]] 7, wherein the first and second mirror stacks are lower and upper mirror stacks, respectively.

21. – 23. **(Canceled)**

24. **(Currently amended)** A tunnel junction according to claim [[23]] 29, wherein the modulation-doped layer is doped with an effective carrier concentration greater than $1x10^{19}$ cm^{-3}.

25. **(Canceled)**

26. **(Currently amended)** A tunnel junction according to claim [[25]] 29, wherein a total thickness of the ~~first layer and the second~~ modulation-doped layer is in a range of about 0.lnm ~ about 2nm.

27. – 28. **(Canceled)**

29. **(Currently amended)** A tunnel junction ~~according to claim 23, wherein the modulation doped layer is~~ including a modulation doped layer that comprises an AlInAs layer epitaxially grown as a digital alloy of p-type doped AlAs and InAs.

30. **(Original)** A tunnel junction according to claim 29, wherein the p-type AlAs layer is doped with carbon to a concentration greater than $1x10^{19}$ cm^{-3}, and wherein an effective doping concentration of the modulation doped layer is greater than $1x10^{19}$ cm^{-3}.

31. **(Currently amended)** A tunnel junction according to claim [[23]] 29, ~~an n-layer of~~ wherein the tunnel junction includes ~~the modulation doped layer~~ an n-type layer.

32. – 40. **(Canceled)**